



Treadwell Cattle Co

TCEQ Docket # 2011-2288-WR / 2011-2287-WR

TEXAS
COMMISSION
ON ENVIRONMENTAL
QUALITY

A protest, by a neutral party to the success or failure of Bentwood CC.

2012 MAY -4 PM 3:46

Protestor, Brian Treadwell of Treadwell Cattle Co, purchased the farm originally associated with permit 1313 in 2007, which includes the location of the original diversion point of record for permit 1311. Due to "extreme low flow conditions" of the South Concho River in May of 2011, the TCEQ watermaster caused Treadwell Cattle to stop diverting on both permit 1313 and 1310, while Bentwood Country Club was allowed to continue pumping without interruption from Bentwood's portion of 1313, from their provisional, proposed new diversion location. Despite the impossible nature of actual South Concho River water reaching Bentwood CC's proposed new diversion location, the TCEQ Watermaster treated Bentwood's portion of permit 1313 as superior to Treadwell Cattle Co, and as a fact, allowed Bentwood to double the weekly water diverted, once Treadwell Cattle Co was sidelined, verifiable by an audit of South Concho diversions from May-July 2011.

The TCEQ's recommendation for approval of Bentwood Country Club's request to relocate South Concho permit 1313 from 1313's historic diversion point to a location on the shore of lake Nasworthy abuses the scope of authority given to the TCEQ and sets a precedent by which the regulatory authority, the TCEQ, has, in fact, approved a permit move to a location not regularly serviced by the stream segment from which the permit originated. The hydrological dynamic which interrupts the flow of the South Concho River at the South Pool of Twin Buttes, failing to connect via the "equalization channel" to the North Pool of Twin Buttes and thus remaining unable to pass through the North Pool outlet, making it impossible for South Concho water to flow into lake Nasworthy and on towards the Gulf of Mexico has been waived, overlooked, or understudied.

A thorough study of the impacts of moving permit 1313, should have, at the very least, stipulated that actual South Concho water should be flowing to the new diversion location as a basic tenet of use. While Bentwood's proposed new diversion location is located on or near the historic banks of the South Concho River, the South Pool of Twin Buttes Reservoir physically prevents the constant flow of the South Concho River segment from continuing in the Historic South Concho river course, and as a result, all points downstream of the South Pool are known as "South Concho" only in nomenclature and not as an indication of the origin of the river water itself.

The attached documents are USGS records for the water elevation in the South Pool of Twin Buttes (attachment A), where more often than not, the lake remains below "Dead Pool Level". "Dead Pool Level" is defined by the USGS and adopted by the Texas Water Development Board in reservoir terminology as, **"Dead Pool Storage is that part of the total reservoir capacity below the lowest outlet level from which water cannot be released by gravity flow"**. For us non-hydrologists, that means when the lake water elevation is below the "Dead Pool Level", the water from the South Concho is terminated at the South Pool of Twin Buttes. Logically, if the flow of the South Concho is terminated at a point prior to the designated "new diversion location", it would be impossible for Bentwood to access the water their permit entitles them to use, at the proposed diversion location.

By authorizing the relocation of permit 1313 for Bentwood CC, and through the TCEQ's approved special provisional use of permit 1313, at the proposed new diversion location, without prejudice in regards to the

presence of actual South Concho River water occurring at the new diversion location, the TCEQ is authorizing the transfer of a South Concho River permit and altering the nature of this South Concho River permit into an already over-appropriated Middle Concho, Dove Creek, Spring Creek watershed permit, with laundered water serviced from the North Pool of Twin Buttes.

According to the attached USGS Water Data Reports included from October 2005 to September 2011, from October 1, 2005 to May 20, 2006, the South Concho flowed through the equalization channel from the South Pool to the North Pool and points beyond. But from May 20, 2006 to August 31 2006, during peak irrigation months, the South Concho remained trapped below the "Dead Pool Level" elevation, and could not flow to lake Nasworthy. The period of September 2006 to March of 2008 was exceptionally wet with the South Concho flowing to points beyond the South Pool for 18 months in a row. However, for more than the past 3 years, including TCEQ's permit evaluation period for Bentwood's permit relocation request, the period from April 21, 2008 to September 30, 2011 saw no water escape the "Dead Pool Level", (except for August 3-9, 2009 and February 4&5, 2010), however, Bentwood CC pumped without restrictions; simply using available water from a different watershed.

While the Equalization channel is currently maintaining a slight connection between the South Pool Lake and the North Pool Lake, albeit noticeably less water than the volume of water being delivered by the South Concho to the South Pool, the seasonal trend is for the equalization channel to dry up, terminating the South Concho at the South Pool, prior to the peak months for golf course irrigation. The fact that South Concho water has only flowed beyond the South Pool 18 months and a few rainy days out of the past 7 years should be a major consideration for relocating a South Concho River permit downstream of the South Pool of Twin Buttes. At the very minimum, the TCEQ should require South Concho water to be above the "Dead Pool Level" in the South Pool of Twin Buttes for Bentwood to divert water using their South Concho permits.

Respectfully submitted,

Brian Treadwell

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Water-Data Report 2011

08131200 Twin Buttes Reservoir near San Angelo, TX

Middle Colorado-Concho Basin
South Concho Subbasin

LOCATION.--Lat 31°22'55", long 100°32'17" referenced to North American Datum of 1927, Tom Green County, TX, Hydrologic Unit 12090102, in outlet control tower near left end of Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 mi upstream from Lake Nasworthy Dam, 8.1 mi southwest of San Angelo, and 75.0 mi upstream from mouth.

DRAINAGE AREA.--3,868 mi² of which 1,055 mi² probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--Oct. 1962 to Sept. 2003 (contents), Oct. 2003 to current year.

PERIOD OF RECORD, Water-Quality.--

CHEMICAL DATA: May 1965 to Nov. 1966 and July 1970 to Apr. 1984.

BIOCHEMICAL DATA: May 1965 to Nov. 1966 and July 1970 to Oct. 1973.

REVISED RECORDS.--WDR TX-81-3: Drainage area.

GAGE.--Water-stage recorder and nonrecording gage on Middle Concho-Spring Creek pool and nonrecording gage on South Concho pool. Datum of gage is NGVD of 1929. Satellite telemeter at station.

COOPERATION.--Records of diversion may be obtained from the city of San Angelo.

REMARKS.--Records fair, the South Concho and Middle Concho-Spring Creek pools were not equalized. The reservoir is formed by a rolled earthfill dam 8.1 mi long, including a 200-foot-wide uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot concrete conduits, each controlled by a 12.0- by 15.0-foot fixed-wheel gate and a 12.0- by 15.0-foot radial gate, located in the Middle Concho-Spring Creek pool. Low-flow releases are made through 2.0- by 2.0-foot gates located in the center of three fixed-wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22-mile equalizing channel. At an elevation of 1,926.5 ft, the two pools join to form one lake. Lake level elevations below 1,926.5 ft represent Middle Concho-Spring Creek pool only. Deliberate impoundment of water began on Dec 1, 1962; dam was completed Feb 13, 1963. In June 1999, construction of a cutoff wall to stop seepage was completed. Capacity curve is based on a survey made in 1958. Reservoir is owned by the city of San Angelo and was built for flood control, irrigation, and municipal uses. Data regarding the dam are given in the following table:

	Elevation (feet)
Top of dam.....	1,991.0
Crest of spillway.....	1,969.1
Top of conservation storage.....	1,940.2
Bottom of equalizing channel (Middle Concho-Spring Creek pool).....	1,926.5
Dead storage in South Concho pool.....	1,926.5
Lowest gated outlet (Invert at Middle Concho-Spring Creek pool).....	1,885.0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 205,200 acre-ft, May 12, 1975, elevation, 1,942.20 ft; minimum since first appreciable storage, 2,120 acre-ft, Apr. 15, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 1,907.27 ft, Oct. 1; minimum elevation, 1,891.86 ft, Sept. 30.

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued

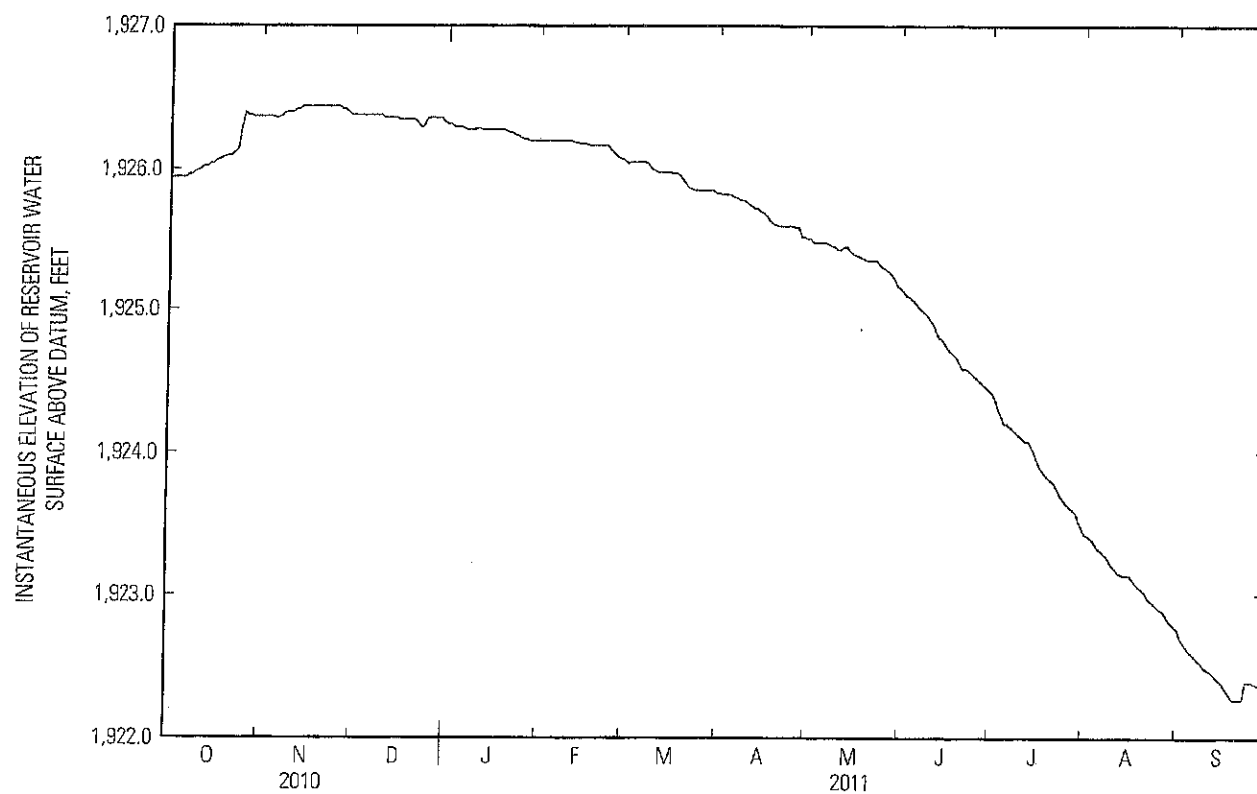
SOUTH CONCHO POOL
ELEVATION OF RESERVOIR WATER SURFACE ABOVE DATUM, FEET
WATER YEAR OCTOBER 2010 TO SEPTEMBER 2011
DAILY INSTANTANEOUS VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,925.94	1,926.37	1,926.38	1,926.32	1,926.20	1,926.04	1,925.82	1,925.51	1,925.13	1,924.41	1,923.43	1,922.76
2	1,925.94	1,926.37	1,926.38	1,926.30	1,926.20	1,926.05	1,925.82	1,925.48	1,925.10	1,924.37	1,923.42	1,922.70
3	1,925.94	1,926.37	1,926.38	1,926.30	1,926.20	1,926.05	1,925.82	1,925.48	1,925.09	1,924.30	1,923.40	1,922.67
4	1,925.94	1,926.36	1,926.38	1,926.30	1,926.20	1,926.05	1,925.82	1,925.48	1,925.07	1,924.26	1,923.38	1,922.64
5	1,925.94	1,926.36	1,926.38	1,926.29	1,926.20	1,926.05	1,925.80	1,925.48	1,925.05	1,924.20	1,923.34	1,922.61
6	1,925.94	1,926.37	1,926.38	1,926.28	1,926.20	1,926.05	1,925.80	1,925.48	1,925.02	1,924.20	1,923.32	1,922.59
7	1,925.96	1,926.39	1,926.38	1,926.28	1,926.20	1,926.05	1,925.78	1,925.47	1,925.00	1,924.18	1,923.30	1,922.57
8	1,925.96	1,926.40	1,926.38	1,926.28	1,926.20	1,926.03	1,925.78	1,925.46	1,924.98	1,924.16	1,923.28	1,922.55
9	1,925.98	1,926.40	1,926.38	1,926.28	1,926.20	1,926.00	1,925.77	1,925.45	1,924.96	1,924.14	1,923.25	1,922.53
10	1,925.99	1,926.40	1,926.36	1,926.29	1,926.20	1,925.99	1,925.75	1,925.43	1,924.93	1,924.12	1,923.21	1,922.50
11	1,926.00	1,926.42	1,926.36	1,926.28	1,926.19	1,925.98	1,925.74	1,925.43	1,924.90	1,924.10	1,923.19	1,922.49
12	1,926.02	1,926.42	1,926.36	1,926.28	1,926.19	1,925.98	1,925.72	1,925.45	1,924.85	1,924.08	1,923.16	1,922.48
13	1,926.02	1,926.44	1,926.36	1,926.28	1,926.18	1,925.98	1,925.72	1,925.45	1,924.80	1,924.08	1,923.15	1,922.46
14	1,926.04	1,926.44	1,926.36	1,926.28	1,926.18	1,925.98	1,925.70	1,925.42	1,924.79	1,924.05	1,923.14	1,922.44
15	1,926.04	1,926.44	1,926.35	1,926.28	1,926.18	1,925.98	1,925.69	1,925.40	1,924.76	1,924.00	1,923.14	1,922.42
16	1,926.06	1,926.44	1,926.35	1,926.28	1,926.17	1,925.97	1,925.67	1,925.39	1,924.72	1,923.95	1,923.14	1,922.40
17	1,926.07	1,926.44	1,926.35	1,926.28	1,926.17	1,925.97	1,925.64	1,925.38	1,924.70	1,923.90	1,923.11	1,922.36
18	1,926.08	1,926.44	1,926.35	1,926.28	1,926.17	1,925.96	1,925.62	1,925.37	1,924.68	1,923.87	1,923.08	1,922.33
19	1,926.09	1,926.44	1,926.35	1,926.27	1,926.17	1,925.93	1,925.61	1,925.36	1,924.66	1,923.84	1,923.06	1,922.30
20	1,926.10	1,926.44	1,926.35	1,926.26	1,926.17	1,925.90	1,925.60	1,925.35	1,924.62	1,923.82	1,923.04	1,922.28
21	1,926.10	1,926.44	1,926.33	1,926.26	1,926.17	1,925.87	1,925.60	1,925.35	1,924.58	1,923.80	1,923.02	1,922.28
22	1,926.12	1,926.44	1,926.30	1,926.24	1,926.17	1,925.86	1,925.60	1,925.35	1,924.58	1,923.78	1,922.98	1,922.28
23	1,926.14	1,926.44	1,926.30	1,926.24	1,926.14	1,925.85	1,925.60	1,925.35	1,924.57	1,923.74	1,922.96	1,922.28
24	1,926.29	1,926.44	1,926.35	1,926.22	1,926.12	1,925.85	1,925.60	1,925.32	1,924.55	1,923.70	1,922.94	1,922.40
25	1,926.40	1,926.44	1,926.36	1,926.21	1,926.10	1,925.85	1,925.60	1,925.30	1,924.53	1,923.67	1,922.92	1,922.40
26	1,926.38	1,926.42	1,926.36	1,926.21	1,926.08	1,925.85	1,925.59	1,925.29	1,924.51	1,923.64	1,922.90	1,922.40
27	1,926.38	1,926.42	1,926.36	1,926.20	1,926.07	1,925.85	1,925.59	1,925.27	1,924.49	1,923.62	1,922.89	1,922.39
28	1,926.37	1,926.40	1,926.36	1,926.20	1,926.06	1,925.85	1,925.52	1,925.25	1,924.47	1,923.60	1,922.86	1,922.38
29	1,926.37	1,926.38	1,926.36	1,926.20	—	1,925.85	1,925.52	1,925.22	1,924.45	1,923.58	1,922.82	1,922.37
30	1,926.37	1,926.38	1,926.33	1,926.20	—	1,925.83	1,925.51	1,925.17	1,924.43	1,923.52	1,922.80	1,922.37
31	1,926.37	—	1,926.32	1,926.20	—	1,925.83	—	1,925.15	—	1,923.48	1,922.78	—
Mean	1,926.11	1,926.41	1,926.36	1,926.26	1,926.17	1,925.95	1,925.68	1,925.38	1,924.77	1,923.94	1,923.11	1,922.45
Max	1,926.40	1,926.44	1,926.38	1,926.32	1,926.20	1,926.05	1,925.82	1,925.51	1,925.13	1,924.41	1,923.43	1,922.76
Min	1,925.94	1,926.36	1,926.30	1,926.20	1,926.06	1,925.83	1,925.51	1,925.15	1,924.43	1,923.48	1,922.78	1,922.28

Water Year 2011	
Mean	1,925.21
Max	1,926.44
Min	1,922.28

No Water passed from South pool to points beyond 2011

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued



Water-Data Report 2010

08131200 Twin Buttes Reservoir near San Angelo, TX

Middle Colorado-Concho Basin
South Concho Subbasin

LOCATION.--Lat 31°22'55", long 100°32'17" referenced to North American Datum of 1927, Tom Green County, TX, Hydrologic Unit 12090102, in outlet control tower near left end of Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 mi upstream from Lake Nasworthy Dam, 8.1 mi southwest of San Angelo, and 75.0 mi upstream from mouth.

DRAINAGE AREA.--3,868 mi² of which 1,055 mi² probably is noncontributing.

SURFACE-WATER RECORDS

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PERIOD OF RECORD, Water-Quality.--

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REVISED RECORDS.--WDR TX-81-3: Drainage area.

GAGE.--Water-stage recorder and nonrecording gage on Middle Concho-Spring Creek pool and nonrecording gage on South Concho pool. Datum of gage is NGVD of 1929. Satellite telemeter at station.

COOPERATION.--Records of diversion may be obtained from the city of San Angelo.

REMARKS.--Records fair, the South Concho and Middle Concho-Spring Creek pools were not equalized. The reservoir is formed by a rolled earthfill dam 8.1 mi long, including a 200-foot-wide uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot concrete conduits, each controlled by a 12.0- by 15.0-foot fixed-wheel gate and a 12.0- by 15.0-foot radial gate, located in the Middle Concho-Spring Creek pool. Low-flow releases are made through 2.0- by 2.0-foot gates located in the center of three fixed-wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22-mile equalizing channel. At an elevation of 1,926.5 ft, the two pools join to form one lake. Lake level elevations below 1,926.5 ft represent Middle Concho-Spring Creek pool only. Deliberate impoundment of water began on Dec 1, 1962; dam was completed Feb 13, 1963. In June 1999, construction of a cutoff wall to stop seepage was completed. Capacity curve is based on a survey made in 1958. Reservoir is owned by the city of San Angelo and was built for flood control, irrigation, and municipal uses. Data regarding the dam are given in the following table:

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Crest of spillway.....	1,969.1
Top of conservation storage.....	1,940.2
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Dead storage in South Concho pool.....	1,926.5
Lowest gated outlet (invert at Middle Concho-Spring Creek pool).....	1,885.0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 205,200 acre-ft, May 12, 1975, elevation, 1,942.20 ft; minimum since first appreciable storage, 2,120 acre-ft, Apr. 15, 1971.

EXTREMES FOR CURRENT YEAR.--Middle Concho-Spring Creek pool: Maximum daily elevation, 1913.72 ft, May 2; minimum daily elevation, 1907.27 ft, Sept. 30. South Concho pool: Maximum daily elevation, 1927.05 ft, Feb. 4; minimum daily elevation, 1925.48 ft, Aug. 22-24.

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued

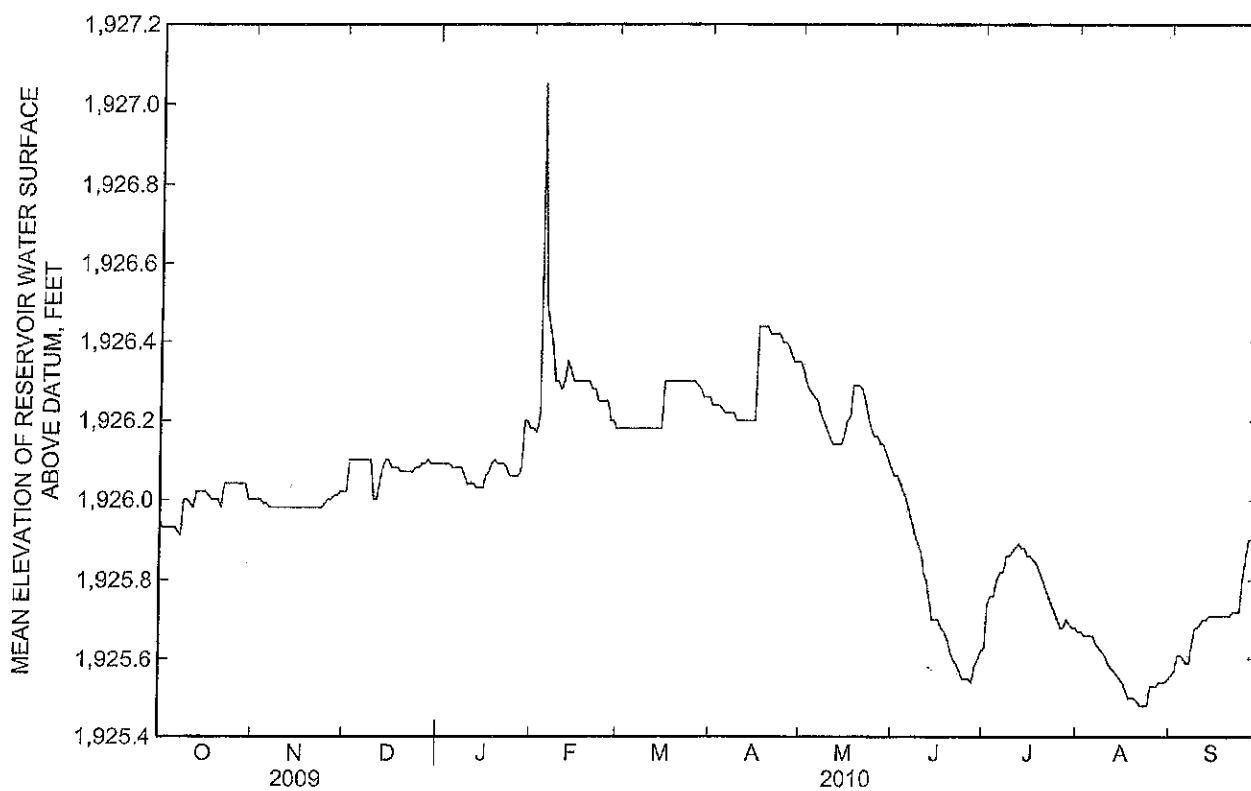
SOUTH CONCHO POOL
ELEVATION OF RESERVOIR WATER SURFACE ABOVE DATUM, FEET
WATER YEAR OCTOBER 2009 TO SEPTEMBER 2010
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,925.95	1,926.00	1,926.02	1,926.09	1,926.18	1,926.18	1,926.24	1,926.33	1,926.06	1,925.63	1,925.67	1,925.56
2	1,925.93	1,926.00	1,926.10	1,926.09	1,926.17	1,926.18	1,926.24	1,926.30	1,926.06	1,925.74	1,925.67	1,925.57
3	1,925.93	1,926.00	1,926.10	1,926.09	1,926.22	1,926.18	1,926.24	1,926.28	1,926.04	1,925.76	1,925.66	1,925.61
4	1,925.93	1,925.99	1,926.10	1,926.09	1,927.05	1,926.18	1,926.23	1,926.27	1,926.02	1,925.76	1,925.66	1,925.61
5	1,925.93	1,925.99	1,926.10	1,926.08	1,926.50	1,926.18	1,926.22	1,926.26	1,926.00	1,925.80	1,925.66	1,925.60
6	1,925.93	1,925.98	1,926.10	1,926.08	1,926.45	1,926.18	1,926.22	1,926.25	1,925.97	1,925.82	1,925.66	1,925.59
7	1,925.92	1,925.98	1,926.10	1,926.08	1,926.40	1,926.18	1,926.22	1,926.22	1,925.94	1,925.82	1,925.64	1,925.59
8	1,925.91	1,925.98	1,926.10	1,926.08	1,926.30	1,926.18	1,926.22	1,926.20	1,925.91	1,925.86	1,925.63	1,925.64
9	1,926.00	1,925.98	1,926.10	1,926.06	1,926.30	1,926.18	1,926.20	1,926.18	1,925.89	1,925.86	1,925.62	1,925.68
10	1,926.00	1,925.98	1,926.00	1,926.04	1,926.28	1,926.18	1,926.20	1,926.16	1,925.87	1,925.87	1,925.61	1,925.68
11	1,925.99	1,925.98	1,926.00	1,926.04	1,926.30	1,926.18	1,926.20	1,926.14	1,925.82	1,925.88	1,925.59	1,925.69
12	1,925.98	1,925.98	1,926.04	1,926.04	1,926.35	1,926.18	1,926.20	1,926.14	1,925.80	1,925.89	1,925.58	1,925.70
13	1,926.02	1,925.98	1,926.08	1,926.03	1,926.33	1,926.18	1,926.20	1,926.14	1,925.75	1,925.88	1,925.57	1,925.70
14	1,926.02	1,925.98	1,926.10	1,926.03	1,926.30	1,926.18	1,926.20	1,926.14	1,925.70	1,925.88	1,925.56	1,925.71
15	1,926.02	1,925.98	1,926.10	1,926.03	1,926.30	1,926.18	1,926.20	1,926.16	1,925.70	1,925.86	1,925.55	1,925.71
16	1,926.02	1,925.98	1,926.08	1,926.06	1,926.30	1,926.30	1,926.44	1,926.20	1,925.70	1,925.86	1,925.54	1,925.71
17	1,926.01	1,925.98	1,926.08	1,926.07	1,926.30	1,926.30	1,926.44	1,926.21	1,925.68	1,925.85	1,925.52	1,925.71
18	1,926.00	1,925.98	1,926.08	1,926.09	1,926.30	1,926.30	1,926.44	1,926.29	1,925.67	1,925.84	1,925.50	1,925.71
19	1,926.00	1,925.98	1,926.07	1,926.10	1,926.30	1,926.30	1,926.44	1,926.29	1,925.65	1,925.82	1,925.50	1,925.71
20	1,926.00	1,925.98	1,926.07	1,926.09	1,926.28	1,926.30	1,926.42	1,926.29	1,925.62	1,925.80	1,925.50	1,925.71
21	1,925.98	1,925.98	1,926.07	1,926.09	1,926.28	1,926.30	1,926.42	1,926.28	1,925.60	1,925.78	1,925.49	1,925.71
22	1,926.04	1,925.98	1,926.07	1,926.09	1,926.25	1,926.30	1,926.42	1,926.25	1,925.59	1,925.76	1,925.48	1,925.72
23	1,926.04	1,925.98	1,926.07	1,926.08	1,926.25	1,926.30	1,926.42	1,926.21	1,925.57	1,925.74	1,925.48	1,925.72
24	1,926.04	1,925.99	1,926.08	1,926.06	1,926.25	1,926.30	1,926.40	1,926.18	1,925.55	1,925.72	1,925.48	1,925.72
25	1,926.04	1,926.00	1,926.08	1,926.06	1,926.25	1,926.30	1,926.40	1,926.16	1,925.55	1,925.70	1,925.53	1,925.80
26	1,926.04	1,926.00	1,926.09	1,926.06	1,926.20	1,926.30	1,926.39	1,926.16	1,925.55	1,925.68	1,925.53	1,925.85
27	1,926.04	1,926.01	1,926.09	1,926.06	1,926.20	1,926.29	1,926.37	1,926.14	1,925.54	1,925.68	1,925.53	1,925.90
28	1,926.04	1,926.01	1,926.10	1,926.08	1,926.18	1,926.28	1,926.35	1,926.14	1,925.58	1,925.70	1,925.54	1,925.90
29	1,926.04	1,926.02	1,926.09	1,926.20	---	1,926.26	1,926.35	1,926.12	1,925.60	1,925.69	1,925.54	1,925.90
30	1,926.00	1,926.02	1,926.09	1,926.20	---	1,926.26	1,926.35	1,926.10	1,925.62	1,925.68	1,925.54	1,925.94
31	1,926.00	---	1,926.09	1,926.18	---	1,926.26	---	1,926.08	---	1,925.68	1,925.55	---
Mean	1,925.99	1,925.99	1,926.08	1,926.08	1,926.31	1,926.24	1,926.31	1,926.20	1,925.75	1,925.78	1,925.57	1,925.71
Max	1,926.04	1,926.02	1,926.10	1,926.20	1,927.05	1,926.30	1,926.44	1,926.33	1,926.06	1,925.89	1,925.67	1,925.94
Min	1,925.91	1,925.98	1,926.00	1,926.03	1,926.17	1,926.18	1,926.20	1,926.08	1,925.54	1,925.63	1,925.48	1,925.56

	Calendar Year 2009	Water Year 2010
Mean	1,925.95	1,926.00
Max	1,927.10	1,927.05
Min	1,925.39	1,925.48

South Concho water made it out of South Pool Two (2) days in 2010

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued





Water-Data Report 2009

08131200 Twin Buttes Reservoir near San Angelo, TX

Middle Colorado-Concho Basin
South Concho Subbasin

LOCATION.--Lat 31°22'55", long 100°32'17" referenced to North American Datum of 1927, Tom Green County, TX, Hydrologic Unit 12090102, in outlet control tower near left end of Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 mi upstream from Lake Nasworthy Dam, 8.1 mi southwest of San Angelo, and 75.0 mi upstream from mouth.

DRAINAGE AREA.--3,868 mi² of which 1,055 mi² probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--Oct. 1962 to Sept. 2003 (contents), Oct. 2003 to current year.

PERIOD OF RECORD, Water-Quality.--

CHEMICAL DATA: May 1965 to Nov. 1966 and July 1970 to Apr. 1984.

BIOCHEMICAL DATA: May 1965 to Nov. 1966 and July 1970 to Oct. 1973.

REVISED RECORDS.--WDR TX-81-3: Drainage area.

GAGE.--Water-stage recorder and nonrecording gage on Middle Concho-Spring Creek pool and nonrecording gage on South Concho pool. Datum of gage is NGVD of 1929. Satellite telemeter at station.

COOPERATION.--Records of diversion may be obtained from the city of San Angelo.

REMARKS.--Records fair, the South Concho and Middle Concho-Spring Creek pools were not equalized. The reservoir is formed by a rolled earthfill dam 8.1 mi long, including a 200-foot-wide uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot concrete conduits, each controlled by a 12.0- by 15.0-foot fixed-wheel gate and a 12.0- by 15.0-foot radial gate, located in the Middle Concho-Spring Creek pool. Low-flow releases are made through 2.0- by 2.0-foot gates located in the center of three fixed-wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22-mile equalizing channel. At an elevation of 1,926.5 ft, the two pools join to form one lake. Lake level elevations below 1,926.5 ft represent Middle Concho-Spring Creek pool only. Deliberate impoundment of water began on Dec 1, 1962; dam was completed Feb 13, 1963. In June 1999, construction of a cutoff wall to stop seepage was completed. Capacity curve is based on a survey made in 1958. Reservoir is owned by the city of San Angelo and was built for flood control, irrigation, and municipal uses. Data regarding the dam are given in the following table:

	Elevation (feet)
Top of dam.....	1,991.0
Crest of spillway.....	1,969.1
Top of conservation storage.....	1,940.2
Bottom of equalizing channel (Middle Concho-Spring Creek pool).....	1,926.5
Dead storage in South Concho pool.....	1,926.5
Lowest gated outlet (invert at Middle Concho-Spring Creek pool).....	1,885.0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 205,200 acre-ft, May 12, 1975, elevation, 1,942.20 ft; minimum since first appreciable storage, 2,120 acre-ft, Apr. 15, 1971.

EXTREMES FOR CURRENT YEAR.---Middle Concho-Spring Creek Pool: Maximum daily elevation, 1918.12 ft on Oct. 1; minimum daily elevation, 1909.96 ft on Sept. 10.

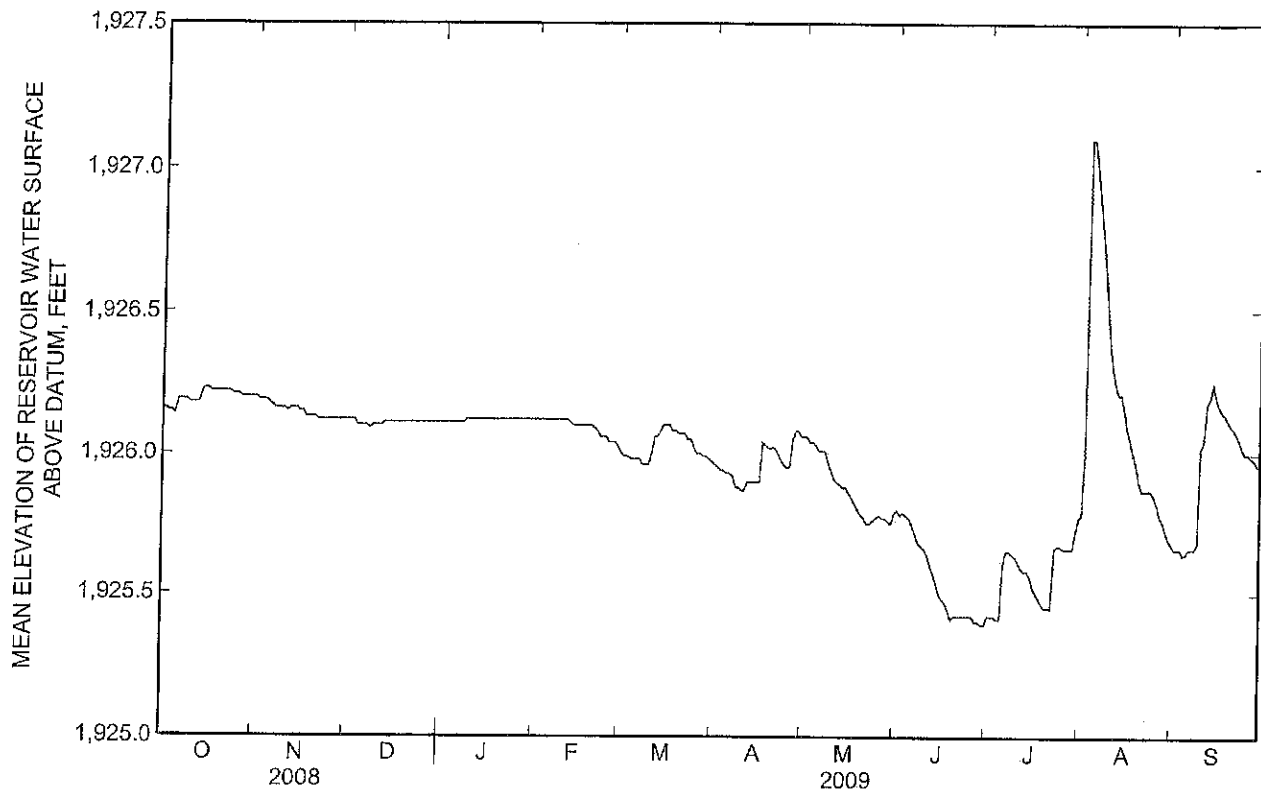
08131200 Twin Buttes Reservoir near San Angelo, TX—Continued

ELEVATION OF RESERVOIR WATER SURFACE ABOVE DATUM, FEET
WATER YEAR OCTOBER 2008 TO SEPTEMBER 2009
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,926.16	1,926.20	1,926.12	1,926.11	1,926.12	1,926.00	1,925.96	1,926.06	1,925.80	1,925.42	1,925.78	1,925.66
2	1,926.16	1,926.19	1,926.12	1,926.11	1,926.12	1,925.99	1,925.95	1,926.06	1,925.78	1,925.42	1,926.00	1,925.66
3	1,926.15	1,926.19	1,926.12	1,926.11	1,926.12	1,925.99	1,925.94	1,926.04	1,925.79	1,925.42	1,927.10	1,925.66
4	1,926.15	1,926.19	1,926.10	1,926.11	1,926.12	1,925.98	1,925.94	1,926.04	1,925.78	1,925.41	1,927.10	1,925.64
5	1,926.14	1,926.18	1,926.10	1,926.11	1,926.12	1,925.98	1,925.93	1,926.03	1,925.77	1,925.41	1,927.00	1,925.64
6	1,926.19	1,926.17	1,926.10	1,926.11	1,926.12	1,925.98	1,925.93	1,926.01	1,925.74	1,925.60	1,926.90	1,925.66
7	1,926.19	1,926.16	1,926.10	1,926.11	1,926.12	1,925.98	1,925.92	1,926.01	1,925.71	1,925.65	1,926.80	1,925.66
8	1,926.19	1,926.16	1,926.09	1,926.11	1,926.12	1,925.96	1,925.88	1,926.01	1,925.68	1,925.65	1,926.68	1,925.66
9	1,926.19	1,926.16	1,926.10	1,926.12	1,926.12	1,925.96	1,925.88	1,925.97	1,925.67	1,925.64	1,926.58	1,925.68
10	1,926.18	1,926.16	1,926.10	1,926.12	1,926.12	1,925.96	1,925.87	1,925.94	1,925.66	1,925.63	1,926.38	1,926.02
11	1,926.18	1,926.15	1,926.10	1,926.12	1,926.12	1,926.00	1,925.87	1,925.91	1,925.64	1,925.61	1,926.30	1,926.04
12	1,926.18	1,926.16	1,926.10	1,926.12	1,926.11	1,926.06	1,925.90	1,925.90	1,925.60	1,925.59	1,926.25	1,926.18
13	1,926.18	1,926.16	1,926.11	1,926.12	1,926.10	1,926.06	1,925.90	1,925.89	1,925.57	1,925.58	1,926.21	1,926.20
14	1,926.22	1,926.16	1,926.11	1,926.12	1,926.10	1,926.08	1,925.90	1,925.88	1,925.54	1,925.58	1,926.21	1,926.25
15	1,926.23	1,926.15	1,926.11	1,926.12	1,926.10	1,926.10	1,925.90	1,925.88	1,925.50	1,925.56	1,926.15	1,926.20
16	1,926.23	1,926.15	1,926.11	1,926.12	1,926.10	1,926.10	1,925.90	1,925.86	1,925.48	1,925.52	1,926.09	1,926.17
17	1,926.22	1,926.13	1,926.11	1,926.12	1,926.10	1,926.10	1,926.04	1,925.84	1,925.47	1,925.50	1,926.04	1,926.15
18	1,926.22	1,926.13	1,926.11	1,926.12	1,926.10	1,926.08	1,926.03	1,925.82	1,925.44	1,925.48	1,926.00	1,926.14
19	1,926.22	1,926.13	1,926.11	1,926.12	1,926.10	1,926.08	1,926.02	1,925.80	1,925.41	1,925.46	1,925.96	1,926.12
20	1,926.22	1,926.13	1,926.11	1,926.12	1,926.09	1,926.07	1,926.02	1,925.78	1,925.42	1,925.45	1,925.90	1,926.10
21	1,926.22	1,926.12	1,926.11	1,926.12	1,926.08	1,926.07	1,926.02	1,925.77	1,925.42	1,925.45	1,925.87	1,926.09
22	1,926.22	1,926.12	1,926.11	1,926.12	1,926.06	1,926.07	1,926.00	1,925.75	1,925.42	1,925.45	1,925.87	1,926.07
23	1,926.22	1,926.12	1,926.11	1,926.12	1,926.06	1,926.05	1,925.98	1,925.75	1,925.42	1,925.66	1,925.87	1,926.05
24	1,926.21	1,926.12	1,926.11	1,926.12	1,926.06	1,926.05	1,925.96	1,925.76	1,925.42	1,925.67	1,925.87	1,926.02
25	1,926.21	1,926.12	1,926.11	1,926.12	1,926.04	1,926.02	1,925.95	1,925.77	1,925.42	1,925.67	1,925.85	1,926.00
26	1,926.21	1,926.12	1,926.11	1,926.12	1,926.04	1,926.00	1,925.95	1,925.78	1,925.42	1,925.66	1,925.82	1,926.00
27	1,926.20	1,926.12	1,926.11	1,926.12	1,926.04	1,926.00	1,926.05	1,925.77	1,925.40	1,925.66	1,925.78	1,925.99
28	1,926.20	1,926.12	1,926.11	1,926.12	1,926.02	1,925.99	1,926.08	1,925.77	1,925.40	1,925.66	1,925.76	1,925.98
29	1,926.20	1,926.12	1,926.11	1,926.12	---	1,925.99	1,926.08	1,925.76	1,925.39	1,925.66	1,925.73	1,925.96
30	1,926.20	1,926.12	1,926.11	1,926.12	---	1,925.98	1,926.06	1,925.75	1,925.39	1,925.72	1,925.70	1,925.96
31	1,926.20	---	1,926.11	1,926.12	---	1,925.97	---	1,925.79	---	1,925.77	1,925.68	---
Mean	1,926.20	1,926.15	1,926.11	1,926.12	1,926.09	1,926.02	1,925.96	1,925.88	1,925.55	1,925.57	1,926.17	1,925.95
Max	1,926.23	1,926.20	1,926.12	1,926.12	1,926.12	1,926.10	1,926.08	1,926.06	1,925.80	1,925.77	1,927.10	1,926.25
Min	1,926.14	1,926.12	1,926.09	1,926.11	1,926.02	1,925.96	1,925.87	1,925.75	1,925.39	1,925.41	1,925.68	1,925.64

South Concho Water flowed beyond S. Pool 7 (seven) days in '09

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued



Water-Data Report 2008

08131200 Twin Buttes Reservoir near San Angelo, TX

Middle Colorado-Concho Basin
South Concho Subbasin

LOCATION.--Lat 31°22'55", long 100°32'17" referenced to North American Datum of 1927, Tom Green County, TX, Hydrologic Unit 12090102, in outlet control tower near left end of Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 mi upstream from Lake Nasworthy Dam, 8.1 mi southwest of San Angelo, and 75.0 mi upstream from mouth.

DRAINAGE AREA.--3,868 mi² of which 1,055 mi² probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1962 to September 2003 (contents), October 2003 to current year. Water-quality records: Chemical data: May 1965 to November 1966 and July 1970 to April 1984.

REVISED RECORDS.--WDR TX-81-3: Drainage area.

GAGE.--Water-stage recorder and nonrecording gage on Middle Concho-Spring Creek pool and nonrecording gage on South Concho pool. Datum of gage is NGVD of 1929. Satellite telemeter at station.

COOPERATION.--Records of diversion may be obtained from the city of San Angelo.

REMARKS.--Records fair. The reservoir is formed by a rolled earthfill dam 8.1 mi long, including a 200-foot-wide uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot concrete conduits, each controlled by a 12.0- by 15.0-foot fixed-wheel gate and a 12.0- by 15.0-foot radial gate, located in the Middle Concho-Spring Creek pool. Low-flow releases are made through 2.0- by 2.0-foot gates located in the center of three fixed-wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22-mile equalizing channel. The South Concho and Middle Concho-Spring Creek pools were not equalized at an elevation of 1,926.5 ft during the year. Deliberate impoundment of water began on Dec. 1, 1962; dam was completed Feb. 13, 1963. In June 1999, construction of a cutoff wall to stop seepage was completed. Capacity curve is based on a survey made in 1958. Reservoir is owned by the city of San Angelo and was built for flood control, irrigation, and municipal uses. Data regarding the dam are given in the following table:

	Elevation (feet)
Top of dam.....	1,991.0
Bottom of equalizing channel (Middle Concho-Spring Creek pool).....	1,969.1
Top of gates.....	1,926.5
Dead storage in South Concho pool.....	1,926.5
Lowest gated outlet (invert at Middle Concho-Spring Creek pool).....	1,885.0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 205,200 acre-ft, May 12, 1975, elevation, 1,942.20 ft; minimum since first appreciable storage, 2,120 acre-ft, Apr. 15, 1971.

EXTREMES FOR CURRENT YEAR.--Middle Concho-Spring Creek pool: maximum elevation, 1,924.45 ft, Apr. 9-10, 15-17, and minimum elevation observed, 1,918.12 ft, Sept. 30; South Concho pool: maximum elevation observed, 1,927.14 ft, Oct. 1-2, 8-9, and minimum elevation observed, 1,925.90 ft, June 16-17.

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued

SOUTH CONCHO POOL
ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2007 TO SEPTEMBER 2008
DAILY MEAN VALUES

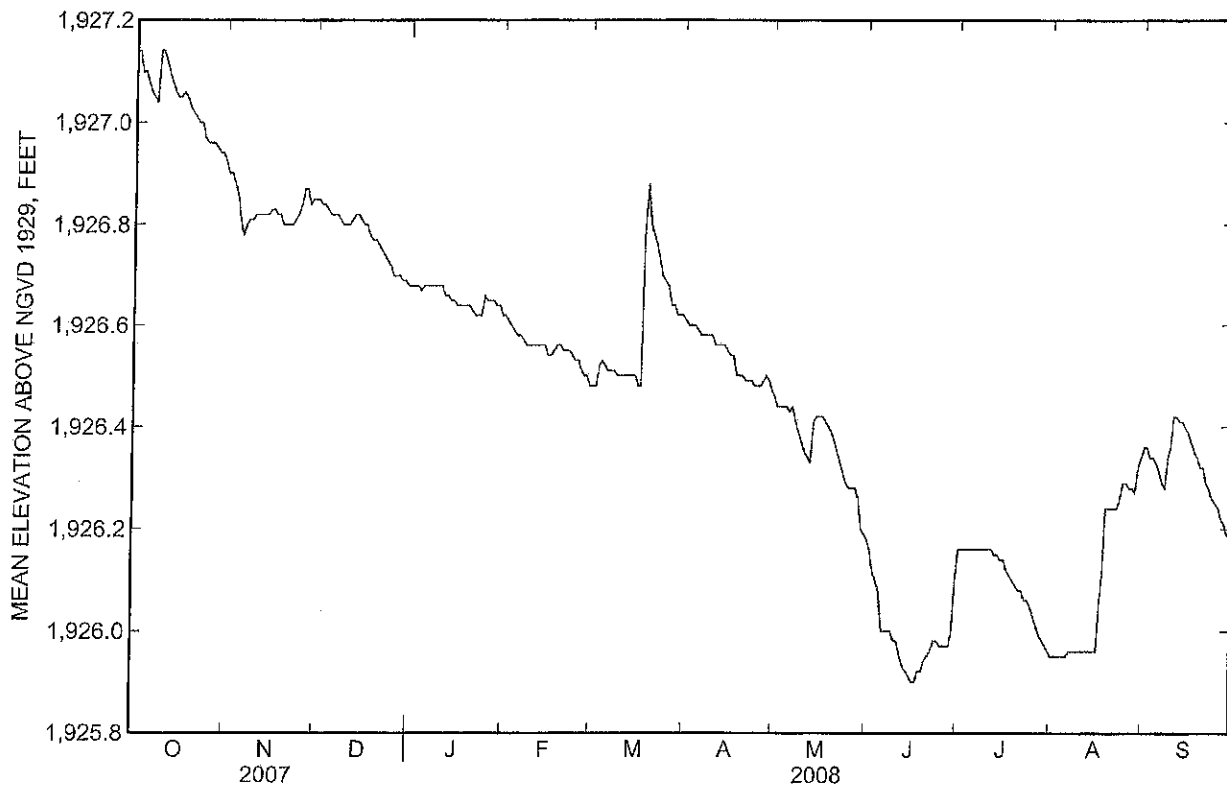
Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,927.14	1,926.90	1,926.85	1,926.68	1,926.62	1,926.48	1,926.61	1,926.46	1,926.18	1,926.16	1,925.95	1,926.36
2	1,927.14	1,926.90	1,926.84	1,926.68	1,926.61	1,926.48	1,926.60	1,926.44	1,926.16	1,926.16	1,925.95	1,926.36
3	1,927.10	1,926.88	1,926.84	1,926.68	1,926.60	1,926.52	1,926.60	1,926.44	1,926.12	1,926.16	1,925.95	1,926.34
4	1,927.10	1,926.86	1,926.83	1,926.67	1,926.59	1,926.53	1,926.60	1,926.44	1,926.10	1,926.16	1,925.95	1,926.34
5	1,927.08	1,926.81	1,926.82	1,926.68	1,926.58	1,926.52	1,926.59	1,926.44	1,926.08	1,926.16	1,925.95	1,926.33
6	1,927.06	1,926.78	1,926.82	1,926.68	1,926.58	1,926.51	1,926.58	1,926.43	1,926.00	1,926.16	1,925.95	1,926.31
7	1,927.05	1,926.80	1,926.82	1,926.68	1,926.57	1,926.51	1,926.58	1,926.44	1,926.00	1,926.16	1,925.96	1,926.29
8	1,927.04	1,926.81	1,926.81	1,926.68	1,926.56	1,926.51	1,926.58	1,926.41	1,926.00	1,926.16	1,925.96	1,926.28
9	1,927.14	1,926.81	1,926.80	1,926.68	1,926.56	1,926.50	1,926.58	1,926.39	1,926.00	1,926.16	1,925.96	1,926.34
10	1,927.14	1,926.82	1,926.80	1,926.68	1,926.56	1,926.50	1,926.58	1,926.37	1,925.98	1,926.16	1,925.96	1,926.36
11	1,927.12	1,926.82	1,926.80	1,926.68	1,926.56	1,926.50	1,926.56	1,926.35	1,925.98	1,926.16	1,925.96	1,926.42
12	1,927.10	1,926.82	1,926.81	1,926.66	1,926.56	1,926.50	1,926.56	1,926.34	1,925.95	1,926.16	1,925.96	1,926.42
13	1,927.08	1,926.82	1,926.82	1,926.66	1,926.56	1,926.50	1,926.56	1,926.33	1,925.93	1,926.15	1,925.96	1,926.41
14	1,927.06	1,926.82	1,926.82	1,926.65	1,926.56	1,926.50	1,926.56	1,926.41	1,925.92	1,926.15	1,925.96	1,926.41
15	1,927.05	1,926.83	1,926.81	1,926.65	1,926.54	1,926.50	1,926.55	1,926.42	1,925.91	1,926.14	1,925.96	1,926.40
16	1,927.05	1,926.83	1,926.80	1,926.64	1,926.54	1,926.48	1,926.54	1,926.42	1,925.90	1,926.14	1,925.96	1,926.39
17	1,927.06	1,926.82	1,926.80	1,926.64	1,926.55	1,926.48	1,926.54	1,926.42	1,925.90	1,926.12	1,926.05	1,926.37
18	1,927.05	1,926.82	1,926.78	1,926.64	1,926.56	1,926.79	1,926.50	1,926.41	1,925.92	1,926.11	1,926.11	1,926.35
19	1,927.03	1,926.80	1,926.77	1,926.64	1,926.56	1,926.88	1,926.50	1,926.40	1,925.92	1,926.10	1,926.24	1,926.34
20	1,927.02	1,926.80	1,926.77	1,926.64	1,926.55	1,926.80	1,926.50	1,926.39	1,925.94	1,926.09	1,926.24	1,926.32
21	1,927.01	1,926.80	1,926.76	1,926.63	1,926.55	1,926.78	1,926.49	1,926.37	1,925.95	1,926.08	1,926.24	1,926.32
22	1,927.00	1,926.80	1,926.75	1,926.62	1,926.55	1,926.76	1,926.49	1,926.35	1,925.96	1,926.08	1,926.24	1,926.29
23	1,927.00	1,926.81	1,926.74	1,926.62	1,926.54	1,926.73	1,926.49	1,926.33	1,925.98	1,926.06	1,926.24	1,926.28
24	1,926.97	1,926.82	1,926.73	1,926.62	1,926.53	1,926.70	1,926.48	1,926.31	1,925.98	1,926.06	1,926.26	1,926.26
25	1,926.96	1,926.84	1,926.72	1,926.66	1,926.53	1,926.69	1,926.48	1,926.29	1,925.97	1,926.05	1,926.29	1,926.25
26	1,926.96	1,926.87	1,926.70	1,926.65	1,926.51	1,926.68	1,926.48	1,926.28	1,925.97	1,926.03	1,926.29	1,926.24
27	1,926.96	1,926.87	1,926.70	1,926.65	1,926.50	1,926.64	1,926.49	1,926.28	1,925.97	1,926.01	1,926.28	1,926.22
28	1,926.95	1,926.84	1,926.70	1,926.65	1,926.50	1,926.64	1,926.50	1,926.28	1,925.97	1,925.99	1,926.28	1,926.21
29	1,926.94	1,926.85	1,926.69	1,926.64	1,926.48	1,926.62	1,926.49	1,926.26	1,926.00	1,925.98	1,926.27	1,926.19
30	1,926.94	1,926.85	1,926.69	1,926.64	---	1,926.62	1,926.47	1,926.20	1,926.10	1,925.97	1,926.32	1,926.18
31	1,926.92	---	1,926.68	1,926.62	---	1,926.62	---	1,926.19	---	1,925.96	1,926.34	---
Mean	1,927.04	1,926.83	1,926.78	1,926.65	1,926.55	1,926.60	1,926.54	1,926.36	1,925.99	1,926.10	1,926.10	1,926.32
Max	1,927.14	1,926.90	1,926.85	1,926.68	1,926.62	1,926.88	1,926.61	1,926.46	1,926.18	1,926.16	1,926.34	1,926.42
Min	1,926.92	1,926.78	1,926.68	1,926.62	1,926.48	1,926.48	1,926.47	1,926.19	1,925.90	1,925.96	1,925.95	1,926.18

Water Year 2008

Mean	1,926.49
Max	1,927.14
Min	1,925.90

S. Concho water flowed beyond S. Pool during Fall of '07 and Early Spring '08. The water quit about the time it would be needed for irrigation.

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued





Water-Data Report 2007

08131200 Twin Buttes Reservoir near San Angelo, TX

Middle Colorado-Concho Basin
South Concho Subbasin

LOCATION.--Lat 31°22'55", long 100°32'17" referenced to North American Datum of 1927, Tom Green County, TX, Hydrologic Unit 12090102, in outlet control tower near left end of Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 mi upstream from Lake Nasworthy Dam, 8.1 mi southwest of San Angelo, and 75.0 mi upstream from mouth.

DRAINAGE AREA.--3,868 mi² of which 1,055 mi² probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1962 to September 2003 (contents), October 2003 to current year. Water-quality records: Chemical data: May 1965 to November 1966 and July 1970 to April 1984.

REVISED RECORDS.--WDR TX-81-3: Drainage area.

GAGE.--Water-stage recorder and nonrecording gage on Middle Concho-Spring Creek pool and nonrecording gage on South Concho pool. Datum of gage is NGVD of 1929. Satellite telemeter at station.

COOPERATION.--Records of diversion may be obtained from the city of San Angelo.

REMARKS.--Records good. The reservoir is formed by a rolled earthfill dam 8.1 mi long, including a 200-foot-wide uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot concrete conduits, each controlled by a 12.0- by 15.0-foot fixed-wheel gate and a 12.0- by 15.0-foot radial gate, located in the Middle Concho-Spring Creek pool. Low-flow releases are made through 2.0- by 2.0-foot gates located in the center of three fixed-wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22-mile equalizing channel. The South Concho and Middle Concho-Spring Creek pools were not equalized at an elevation of 1,926.5 ft during the year. Deliberate impoundment of water began on Dec. 1, 1962; dam was completed Feb. 13, 1963. In June 1999, construction of a cutoff wall to stop seepage was completed. Capacity curve is based on a survey made in 1958. Reservoir is owned by the city of San Angelo and was built for flood control, irrigation, and municipal uses. Data regarding the dam are given in the following table:

	Elevation (feet)
Top of dam.....	1,991.0
Crest of spillway.....	1,969.1
Bottom of equalizing channel (Middle Concho-Spring Creek pool)	1,926.5
Dead storage in South Concho pool.....	1,926.5
Lowest gated outlet (invert at Middle Concho-Spring Creek pool)	1,885.0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 205,200 acre-ft, May 12, 1975, elevation, 1,942.20 ft; minimum since first appreciable storage, 2,120 acre-ft, Apr. 15, 1971.

EXTREMES FOR CURRENT YEAR.--Middle Concho-Spring Creek pool: maximum elevation, 1,921.96 ft, Sept. 30 and minimum elevation observed, 1,909.31 ft, Dec. 7; South Concho pool: maximum elevation observed, 1,929.25 ft, Aug. 22 and minimum elevation observed, 1,926.67 ft, Mar. 8.

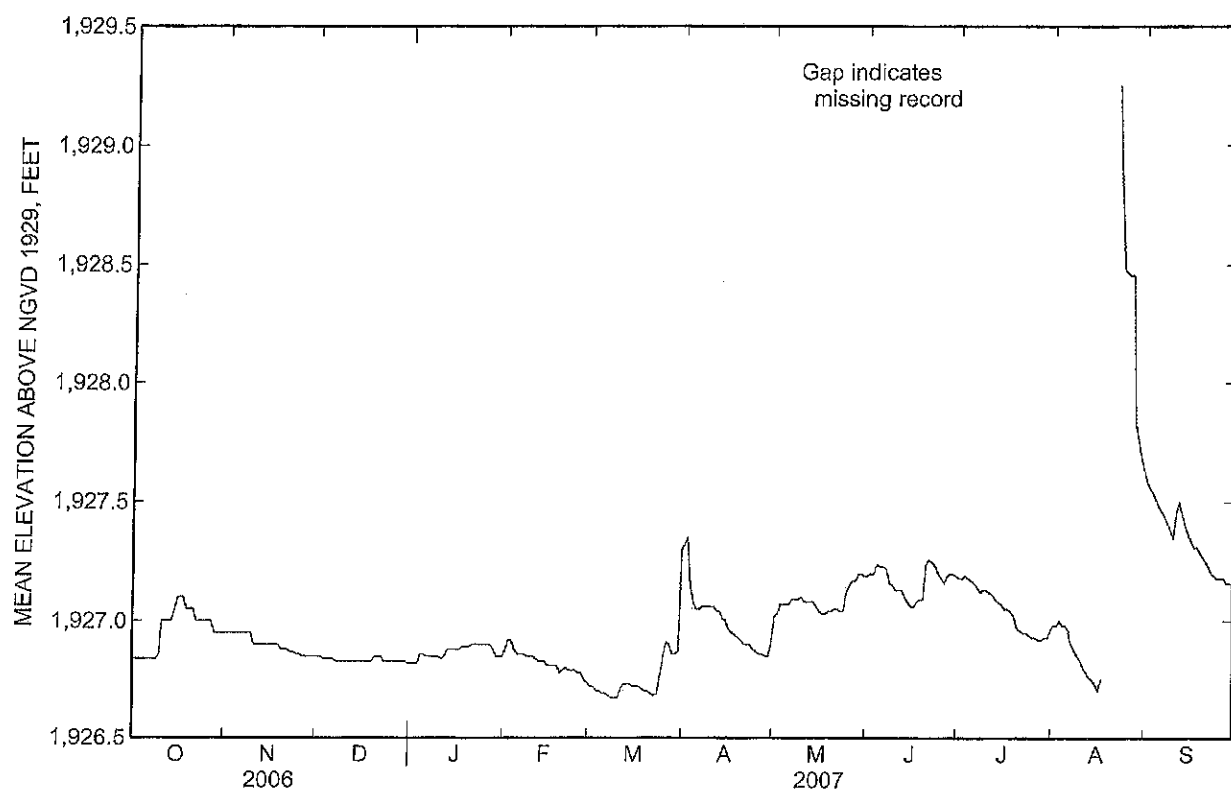
08131200 Twin Buttes Reservoir near San Angelo, TX—Continued

SOUTH CONCHO POOL
ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2006 TO SEPTEMBER 2007
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,926.84	1,926.95	1,926.85	1,926.82	1,926.88	1,926.72	1,927.32	1,927.02	1,927.19	1,927.18	1,926.98	1,927.59
2	1,926.84	1,926.95	1,926.85	1,926.82	1,926.92	1,926.72	1,927.35	1,927.03	1,927.20	1,927.18	1,926.98	1,927.56
3	1,926.84	1,926.95	1,926.84	1,926.82	1,926.92	1,926.70	1,927.16	1,927.07	1,927.20	1,927.19	1,927.00	1,927.54
4	1,926.84	1,926.95	1,926.84	1,926.86	1,926.88	1,926.70	1,927.08	1,927.07	1,927.24	1,927.18	1,926.98	1,927.51
5	1,926.84	1,926.95	1,926.84	1,926.86	1,926.86	1,926.69	1,927.05	1,927.07	1,927.23	1,927.17	1,926.98	1,927.48
6	1,926.84	1,926.95	1,926.84	1,926.85	1,926.86	1,926.69	1,927.05	1,927.07	1,927.23	1,927.16	1,926.96	1,927.46
7	1,926.84	1,926.95	1,926.83	1,926.85	1,926.86	1,926.68	1,927.06	1,927.09	1,927.22	1,927.14	1,926.90	1,927.44
8	1,926.84	1,926.95	1,926.83	1,926.85	1,926.85	1,926.67	1,927.06	1,927.09	1,927.16	1,927.12	1,926.87	1,927.41
9	1,926.84	1,926.95	1,926.83	1,926.85	1,926.85	1,926.67	1,927.06	1,927.09	1,927.15	1,927.13	1,926.85	1,927.38
10	1,926.86	1,926.90	1,926.83	1,926.85	1,926.85	1,926.67	1,927.06	1,927.10	1,927.13	1,927.13	1,926.83	1,927.35
11	1,927.00	1,926.90	1,926.83	1,926.84	1,926.84	1,926.71	1,927.06	1,927.08	1,927.13	1,927.12	1,926.80	1,927.46
12	1,927.00	1,926.90	1,926.83	1,926.85	1,926.83	1,926.73	1,927.04	1,927.08	1,927.13	1,927.11	1,926.78	1,927.50
13	1,927.00	1,926.90	1,926.83	1,926.88	1,926.83	1,926.73	1,927.04	1,927.08	1,927.10	1,927.09	1,926.76	1,927.45
14	1,927.00	1,926.90	1,926.83	1,926.88	1,926.83	1,926.73	1,927.01	1,927.08	1,927.08	1,927.08	1,926.75	1,927.41
15	1,927.05	1,926.90	1,926.83	1,926.88	1,926.81	1,926.72	1,927.00	1,927.06	1,927.06	1,927.07	1,926.73	1,927.37
16	1,927.10	1,926.90	1,926.83	1,926.88	1,926.81	1,926.72	1,926.97	1,927.04	1,927.06	1,927.05	1,926.70	1,927.34
17	1,927.10	1,926.90	1,926.83	1,926.88	1,926.81	1,926.72	1,926.95	1,927.03	1,927.08	1,927.05	1,926.75	1,927.31
18	1,927.10	1,926.90	1,926.83	1,926.89	1,926.81	1,926.71	1,926.94	1,927.03	1,927.09	1,927.04	---	1,927.31
19	1,927.05	1,926.88	1,926.83	1,926.89	1,926.78	1,926.70	1,926.93	1,927.04	1,927.09	1,927.02	---	1,927.29
20	1,927.05	1,926.88	1,926.85	1,926.89	1,926.79	1,926.70	1,926.92	1,927.04	1,927.24	1,926.97	---	1,927.27
21	1,927.05	1,926.88	1,926.85	1,926.90	1,926.80	1,926.69	1,926.90	1,927.05	1,927.26	1,926.96	---	1,927.25
22	1,927.00	1,926.87	1,926.85	1,926.90	1,926.79	1,926.68	1,926.90	1,927.05	1,927.25	1,926.95	1,926.95	1,927.23
23	1,927.00	1,926.87	1,926.83	1,926.90	1,926.79	1,926.69	1,926.90	1,927.04	1,927.23	1,926.95	1,926.80	1,927.20
24	1,927.00	1,926.86	1,926.83	1,926.90	1,926.79	1,926.77	1,926.88	1,927.04	1,927.20	1,926.94	1,926.48	1,927.19
25	1,927.00	1,926.86	1,926.83	1,926.90	1,926.78	1,926.85	1,926.87	1,927.12	1,927.18	1,926.93	1,926.47	1,927.18
26	1,927.00	1,926.85	1,926.83	1,926.90	1,926.78	1,926.91	1,926.86	1,927.15	1,927.16	1,926.93	1,926.46	1,927.18
27	1,927.00	1,926.85	1,926.83	1,926.90	1,926.75	1,926.90	1,926.86	1,927.17	1,927.19	1,926.92	1,926.46	1,927.18
28	1,926.95	1,926.85	1,926.83	1,926.88	1,926.74	1,926.86	1,926.85	1,927.17	1,927.20	1,926.92	1,926.83	1,927.16
29	1,926.95	1,926.85	1,926.83	1,926.85	---	1,926.86	1,926.85	1,927.20	1,927.20	1,926.93	1,927.66	1,927.16
30	1,926.95	1,926.85	1,926.83	1,926.85	---	1,926.87	1,926.91	1,927.20	1,927.19	1,926.93	1,927.69	1,927.15
31	1,926.95	---	1,926.82	1,926.85	---	1,927.30	---	1,927.19	---	1,926.96	1,927.64	---
Mean	1,926.96	1,926.90	1,926.83	1,926.87	1,926.83	1,926.76	1,927.00	1,927.09	1,927.17	1,927.05	---	1,927.34
Max	1,927.10	1,926.95	1,926.85	1,926.90	1,926.92	1,927.30	1,927.35	1,927.20	1,927.26	1,927.19	---	1,927.59
Min	1,926.84	1,926.85	1,926.82	1,926.82	1,926.74	1,926.67	1,926.85	1,927.02	1,927.06	1,926.92	---	1,927.15

S. Concho water flowed beyond S. Pool all of fall '06 - Sept '07

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued





Water-Data Report 2006

08131200 Twin Buttes Reservoir near San Angelo, TX

Middle Colorado-Concho Basin
South Concho Subbasin

LOCATION.--Lat 31°22'55", long 100°32'17" referenced to North American Datum of 1927, Tom Green County, TX, Hydrologic Unit 12090102, in outlet control tower near left end of Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 mi upstream from Lake Nasworthy Dam, 8.1 mi southwest of San Angelo, and 75.0 mi upstream from mouth.

DRAINAGE AREA.--3,868 mi² of which 1,055 mi² probably is noncontributing.

SURFACE-WATER RECORDS

PERIOD OF RECORD.--October 1962 to September 2003 (contents), October 2003 to current year. Water-quality records: Chemical data: May 1965 to November 1966 and July 1970 to April 1984.

REVISED RECORDS.--WDR TX-81-3: Drainage area.

GAGE.--Water-stage recorder and nonrecording gage on Middle Concho-Spring Creek pool and nonrecording gage on South Concho pool. Datum of gage is NGVD of 1929. Satellite telemeter at station.

COOPERATION.--Records of diversion may be obtained from the city of San Angelo.

REMARKS.--Records fair. The reservoir is formed by a rolled earthfill dam 8.1 mi long, including a 200-foot-wide uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot concrete conduits, each controlled by a 12.0- by 15.0-foot fixed-wheel gate and a 12.0- by 15.0-foot radial gate, located in the Middle Concho-Spring Creek pool. Low-flow releases are made through 2.0- by 2.0-foot gates located in the center of three fixed-wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22-mile equalizing channel. The South Concho and Middle Concho-Spring Creek pools were not equalized at an elevation of 1,926.5 ft during the year. Deliberate impoundment of water began on Dec. 1, 1962; dam was completed Feb. 13, 1963. In June 1999, construction of a cutoff wall to stop seepage was completed. Capacity curve is based on a survey made in 1958. Reservoir is owned by the city of San Angelo and was built for flood control, irrigation, and municipal uses. Data regarding the dam are given in the following table:

	Elevation (feet)
Top of dam.....	1,991.0
Crest of spillway.....	1,969.1
Bottom of equalizing channel (Middle Concho-Spring Creek pool).....	1,926.5
Dead storage in South Concho pool.....	1,926.5
Lowest gated outlet (invert at Middle Concho-Spring Creek pool).....	1,885.0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 205,200 acre-ft, May 12, 1975, elevation, 1,942.20 ft; minimum since first appreciable storage, 2,120 acre-ft, Apr. 15, 1971.

EXTREMES FOR CURRENT YEAR.--Middle Concho-Spring Creek pool: maximum elevation, 1,917.05 ft, May 2 and minimum elevation observed, 1,908.65 ft, Aug. 27; South Concho pool: maximum elevation observed, 1,927.31 ft, Oct. 14 and minimum elevation observed, 1,926.00 ft, Aug. 26.

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued

ELEVATION ABOVE NGVD 1929, FEET
WATER YEAR OCTOBER 2005 TO SEPTEMBER 2006
DAILY MEAN VALUES

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	1,927.10	1,927.23	1,927.11	1,927.11	1,927.03	1,926.95	1,926.87	1,926.70	1,926.38	1,926.14	1,926.06	1,926.50
2	1,927.05	1,927.22	1,927.11	1,927.11	1,927.02	1,926.94	1,926.86	1,926.68	1,926.39	1,926.14	1,926.06	1,926.52
3	1,927.00	1,927.20	1,927.11	1,927.10	1,927.02	1,926.94	1,926.86	1,926.67	1,926.39	1,926.26	1,926.05	1,926.54
4	1,927.00	1,927.19	1,927.10	1,927.10	1,927.01	1,926.93	1,926.85	1,926.66	1,926.38	1,926.32	1,926.04	1,926.57
5	1,927.10	1,927.19	1,927.10	1,927.10	1,927.00	1,926.91	1,926.83	1,926.66	1,926.38	1,926.38	1,926.05	1,926.69
6	1,927.10	1,927.19	1,927.10	1,927.10	1,926.99	1,926.90	1,926.82	1,926.65	1,926.36	1,926.37	1,926.05	1,926.71
7	1,927.14	1,927.19	1,927.10	1,927.10	1,926.99	1,926.90	1,926.80	1,926.67	1,926.34	1,926.36	1,926.05	1,926.72
8	1,927.18	1,927.19	1,927.10	1,927.10	1,926.98	1,926.89	1,926.79	1,926.68	1,926.32	1,926.35	1,926.06	1,926.72
9	1,927.20	1,927.19	1,927.10	1,927.10	1,926.97	1,926.88	1,926.79	1,926.67	1,926.30	1,926.34	1,926.06	1,926.73
10	1,927.24	1,927.18	1,927.10	1,927.10	1,926.97	1,926.88	1,926.78	1,926.65	1,926.28	1,926.32	1,926.06	1,926.75
11	1,927.26	1,927.18	1,927.11	1,927.10	1,926.96	1,926.86	1,926.77	1,926.65	1,926.27	1,926.31	1,926.06	1,926.76
12	1,927.25	1,927.18	1,927.12	1,927.10	1,926.96	1,926.85	1,926.72	1,926.63	1,926.26	1,926.28	1,926.06	1,926.77
13	1,927.24	1,927.17	1,927.12	1,927.10	1,926.95	1,926.83	1,926.71	1,926.62	1,926.24	1,926.27	1,926.06	1,926.78
14	1,927.31	1,927.16	1,927.15	1,927.10	1,926.95	1,926.80	1,926.70	1,926.61	1,926.22	1,926.25	1,926.06	1,926.78
15	1,927.30	1,927.16	1,927.14	1,927.10	1,926.95	1,926.79	1,926.69	1,926.60	1,926.20	1,926.23	1,926.06	1,926.79
16	1,927.29	1,927.14	1,927.14	1,927.10	1,926.95	1,926.77	1,926.68	1,926.57	1,926.18	1,926.21	1,926.06	1,926.81
17	1,927.29	1,927.13	1,927.13	1,927.05	1,926.94	1,926.76	1,926.68	1,926.54	1,926.18	1,926.20	1,926.06	1,926.82
18	1,927.29	1,927.12	1,927.13	1,927.05	1,926.93	1,926.84	1,926.68	1,926.52	1,926.19	1,926.20	1,926.06	1,926.84
19	1,927.28	1,927.12	1,927.12	1,927.05	1,926.93	1,926.90	1,926.67	1,926.50	1,926.19	1,926.19	1,926.06	1,926.84
20	1,927.27	1,927.13	1,927.12	1,927.03	1,926.92	1,926.88	1,926.67	1,926.48	1,926.18	1,926.18	1,926.06	1,926.84
21	1,927.25	1,927.13	1,927.12	1,927.03	1,926.92	1,926.86	1,926.78	1,926.47	1,926.18	1,926.17	1,926.06	1,926.84
22	1,927.23	1,927.13	1,927.12	1,927.03	1,926.92	1,926.84	1,926.78	1,926.46	1,926.17	1,926.16	1,926.04	1,926.83
23	1,927.21	1,927.13	1,927.12	1,927.03	1,926.92	1,926.84	1,926.78	1,926.42	1,926.15	1,926.15	1,926.03	1,926.84
24	1,927.20	1,927.12	1,927.12	1,927.03	1,926.92	1,926.82	1,926.78	1,926.40	1,926.16	1,926.14	1,926.02	1,926.84
25	1,927.20	1,927.12	1,927.12	1,927.03	1,926.92	1,926.81	1,926.76	1,926.40	1,926.16	1,926.13	1,926.01	1,926.84
26	1,927.20	1,927.12	1,927.12	1,927.03	1,926.93	1,926.80	1,926.73	1,926.38	1,926.16	1,926.13	1,926.00	1,926.84
27	1,927.19	1,927.12	1,927.12	1,927.03	1,926.95	1,926.80	1,926.72	1,926.38	1,926.16	1,926.12	1,926.15	1,926.84
28	1,927.26	1,927.12	1,927.12	1,927.03	1,926.95	1,926.80	1,926.74	1,926.36	1,926.15	1,926.11	1,926.24	1,926.84
29	1,927.26	1,927.12	1,927.12	1,927.03	---	1,926.88	1,926.71	1,926.36	1,926.15	1,926.10	1,926.42	1,926.84
30	1,927.25	1,927.12	1,927.12	1,927.03	---	1,926.87	1,926.70	1,926.40	1,926.15	1,926.09	1,926.49	1,926.84
31	1,927.24	---	1,927.12	1,927.03	---	1,926.87	---	1,926.40	---	1,926.08	1,926.50	---
Mean	1,927.21	1,927.16	1,927.12	1,927.07	1,926.96	1,926.86	1,926.76	1,926.54	1,926.24	1,926.21	1,926.10	1,926.76
Max	1,927.31	1,927.23	1,927.15	1,927.11	1,927.03	1,926.95	1,926.87	1,926.70	1,926.39	1,926.38	1,926.50	1,926.84
Min	1,927.00	1,927.12	1,927.10	1,927.03	1,926.92	1,926.76	1,926.67	1,926.36	1,926.15	1,926.08	1,926.00	1,926.50

	Calendar Year 2005	Water Year 2006
Mean	1,926.92	1,926.75
Max	1,927.80	1,927.31
Min	1,926.41	1,926.00

S. Concho River did not flow beyond S. Pool during peak

irrigation months of Summer '06

08131200 Twin Buttes Reservoir near San Angelo, TX—Continued

